

#37

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION



SATURN IB/V PROGRAM DIRECTIVE

NUMBER: 37

SUBJECT: SATURN IB/V FLIGHT EVALUATION REQUIREMENTS

ORIGINAL ISSUE DATE: 9/26/66

REVISION NUMBER:

DATE OF REVISION:

PREPARED BY:

Saturn I/IB and V Test Offices

Phone: 876-0860/Baur (I-I/IB-T)

876-1574/Johnson (I-V-T)

I. PURPOSE

This Program Directive:

- A. Establishes "SATURN IB/V FLIGHT EVALUATION REQUIREMENTS."
- B. Satisfies requirements of Apollo Program Directive No. 19.

II. SCOPE

The scope of the flight evaluation requirements described herein covers the requirements for:

- A. Flight test evaluation plans, flight evaluation reports, and presentations.
- B. The identification of all significant flight and launch active ground support hardware failures and anomalies.
- C. Determination of the cause of the failures and anomalies and the identification of corrective actions to be undertaken for subsequent missions.

III. REFERENCE

Apollo Program Directive No. 19, dated June 6, 1966, subject; Apollo Flight Evaluation Requirements.

IV. APPLICABILITY

This Program Directive is applicable to all MSFC launch vehicles and MSFC elements responsible for flight evaluation of Saturn IB/V launch vehicles.

SUBJECT: SATURN IB/V FLIGHT EVALUATION REQUIREMENTS

ORIGINAL ISSUE DATE: 9/26/66

REVISION NUMBER: _____

DATE OF REVISION: _____

PREPARED BY: _____

V. POLICY

- A. Flight evaluation shall be conducted on each Saturn IB/V launch vehicle to ensure that flight test results are used to the maximum to enhance future flight mission success.
- B. The MSFC Flight Evaluation Working Group (FEWG) coordinates, monitors and directs the effort in all phases of flight evaluation of Saturn IB/V launch vehicles in support of the Program Manager.
- C. All NASA intercenter flight evaluation relationships shall be coordinated through the Flight Evaluation Panel (FEP).
- D. Saturn IB/V launch vehicle flight test evaluation plans, reports and presentations shall be prepared for each flight mission.

VI. RESPONSIBILITIES

- A. Saturn I/IB and V Program Managers are responsible for:
 - Establishing requirements for flight evaluation.
 - Flight evaluation of launch vehicles.
 - Designating program representatives to the FEWG and FEP.
 - Flight evaluation presentations to:
 - Apollo Program Director.
 - MSF Management Council.
 - MSF Panel Review Board.
 - Determination of the cause of the failures and anomalies and the identification of corrective actions to be undertaken for subsequent missions.

SATURN IB/V PROGRAM DIRECTIVE

SUPPLEMENT TO PROGRAM DIRECTIVE NR. 37

SUBJECT: SATURN IB/V FLIGHT EVALUATION REQUIREMENTS

ORIGINAL ISSUE DATE: Sept. 26, 1966 **REVISION NUMBER:** _____

DATE OF REVISION: _____ **PREPARED BY:** _____

VI. RESPONSIBILITIES (Continued)

The following additional responsibilities apply to the Saturn V Program, only:

SATURN V	MSFC RESPONSIBLE ELEMENTS				
	Requirements		Documentation		
	Establish	Implement	Prepare	Review	Approve
Flight Evaluation Requirements (This Program Directive)	Prog Mgr (I-V-T Lead)	Prog Mgr (I-V-T Lead)	I-V-T	R&DO, I-V-E, I-V-T, Stage & LVGSE Mgrs	Prog Mgr
Flight Test Evaluation Plans	Prog Mgr (I-V-T Lead)	R&DO IO	FEWG		Prog Mgr
Flight Evaluation Reports	Prog Mgr (I-V-T Lead)	R&DO IO	FEWG		Prog Mgr
Flight Evaluation Presentations (Defined in Para. VII. C)	Prog Mgr (I-V-T Lead)	R&DO IO	FEWG		Prog Mgr

	Established by	Implement	Provide Representation
Flight Evaluation Working Group (FEWG)	Center Director	R&DO IO	R&DO, I-V-E, I-V-T, Stage and LVGSE Mgrs and I-MO
Flight Evaluation Panel (FEP)	OMSF	Centers	R&DO, I-V-E, I-V-T, and I-MO

SATURN IB/V PROGRAM DIRECTIVE

SUBJECT: SATURN IB/V FLIGHT EVALUATION REQUIREMENTS

ORIGINAL ISSUE DATE: 9/26/66 REVISION NUMBER: _____

DATE OF REVISION: _____ PREPARED BY: _____

VI. RESPONSIBILITIES (Continued)

- Acting as the focal point for pre-flight and post-flight evaluation activities. (For Saturn V, this responsibility has been delegated to the Launch Vehicle Manager.)

B. The FEWG in support of the Program Manager is responsible for:

- Flight Test Evaluation Plans
- Flight Evaluation of Launch Vehicles
- Preparation of:
 - Flight Evaluation Reports
 - Flight Evaluation Presentations

C. Detailed responsibilities of MSFC elements engaged in flight test evaluation activities shall be included in the MSFC Flight Test Evaluation Plans.

VII. PROCEDURES

A. Flight Test Evaluation Plans: Flight Test Evaluation Plans shall be prepared by the FEWG to satisfy the requirements of this directive. The plans will include information relative to:

- The FEWG relationship to:
 - MSFC elements

SUBJECT: SATURN IB/V FLIGHT EVALUATION REQUIREMENTSORIGINAL ISSUE DATE: 9/26/66

REVISION NUMBER: _____

DATE OF REVISION: _____

PREPARED BY: _____

VII. PROCEDURES (Continued)

- Flight Evaluation Panel.
- KSC.
- MSC.
- Pre-flight activities including:
 - Plans and schedules.
 - Data acquisition and processing.
 - Pre-flight performance predictions.
 - Communications for flight evaluation.
- Post-flight evaluation activities including:
 - Data evaluation and reporting responsibilities.
 - Preparation of flight evaluation reports and presentations.
 - Coordination and distribution of flight evaluation reports.
- Data reduction responsibilities.
- Contingency plans in the event of premature or unsuccessful termination of an Apollo Mission including:
 - Requirements for security.
 - Investigation procedures.

SATURN IB/V PROGRAM DIRECTIVE

SUBJECT: SATURN IB/V FLIGHT EVALUATION REQUIREMENTS

ORIGINAL ISSUE DATE: 9/26/66

REVISION NUMBER: _____

DATE OF REVISION: _____

PREPARED BY: _____

VII. PROCEDURES (Continued)

- Data handling.

- Reporting.

B. Reports. The FEWG shall prepare flight evaluation reports for the Program Managers to brief the Apollo Program Director as follows:

FLIGHT EVALUATION REPORTS

Report	Communication	To Include	Reviewed by
3 Day	Teletype	Major launch trajectory results including comparison with predicted results. Identification of anomalies or failures, and possible causes.	I-I/IB-T 2 hours I-I/IB-E prior to I-V-T release I-V-E
10 Day	Teletype	Update of 3-day report. Include all anomalies and failures with causes and possible failure mode.	I-I/IB-T 6 hours I-I/IB-E prior to I-V-T release I-V-E
30 Day Failure and Anomalies Listing	Teletype	List of all significant flight and launch anomalies including: (1) Significant malfunctions (2) Performance deviations (3) Systems, subsystems, or hardware failures.	I-I/IB-T 3 days I-I/IB-E prior to I-V-T release I-V-E
60 Day Final Flight Evaluation	Document	Separate summary of failures and anomalies. Results of Apollo experiments. Detailed results and analysis of spacecraft and launch vehicle system and subsystem performance. Detailed description of launch vehicle configuration mission trajectory, and sequential event description.	I-I/IB-T 3 days I-I/IB-E prior to I-V-T release I-V-E

Specific details to be included in these reports will be contained in the Flight Test Evaluation Plans prepared by the FEWG.

SUBJECT: SATURN IB/V FLIGHT EVALUATION REQUIREMENTS

ORIGINAL ISSUE DATE: 9/26/66 REVISION NUMBER: _____

DATE OF REVISION: _____ PREPARED BY: _____

VII. PROCEDURES (Continued)

C. Presentations: The FEWG shall develop flight evaluation presentations for the Program Managers to brief the Apollo Program Director as follows:

- Preliminary results of the flight are to be summarized at the Management Council Meeting following the flight.
- Approximately five weeks after completion of the flight mission, on the date chosen by the Apollo Program Director (MA), MSFC shall make a presentation to the Panel Review Board (PRB) based on Flight Evaluation Panel findings and current in-house activities. The review shall cover as a minimum:
 - A report on the degree to which mission objectives have been satisfied.
 - Trajectory events evaluation.
 - Description of major resolved and unresolved anomalies including data described in the anomalies listing.
 - An identification of major hardware changes and of checkout changes in process by internal Center change procedures resulting from post-flight results.
 - Status report on post-flight testing.

D. PFR/FRR and DCR Documentation: For the subsequent PFR/FRR reviews and for the applicable Design Certification Review (DCR), the anomalies listed in the Final Flight Evaluation Report are to be analyzed to determine the adequacy of the actions

SATURN IB/V PROGRAM DIRECTIVE

SUBJECT: SATURN IB/V FLIGHT EVALUATION REQUIREMENTS

ORIGINAL ISSUE DATE: 9/26/66

REVISION NUMBER: _____

DATE OF REVISION: _____

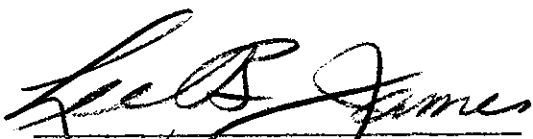
PREPARED BY: _____

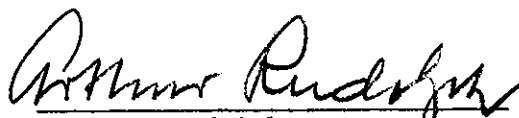
VII. PROCEDURES (Continued)

taken relative to the next mission. This information is to be submitted as part of the documentation required for the FRR Part I and applicable DCR. The results are to be summarized and presented as part of the oral presentation at the Apollo Program Director's FRR.

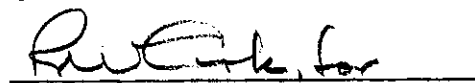
VIII. ACTION

This directive shall be implemented immediately.


 Lee B. James
 Manager, Saturn IB Program


 Arthur Rudolph
 Manager, Saturn V Program

Concurrence:


 Hermann K. Weidner
 Director, R&DO

Distribution (for action):

MSFC:

I-V-MGR, Dr. Rudolph (3)
 I-V-S-IC, Mr. Urlaub (3)
 I-V-S-II, Col. Yarchin (3)
 I-V-S-IVB, Mr. Godfrey (3)
 I-V-IU, Mr. Duerr (3)
 I-V-G, Mr. Smith (3)
 I-V-Q, Mr. Moody (3)
 I-V-E, Mr. Bell (3)
 I-V-P, Mr. Sneed (3)
 I-V-T, Mr. Burns (3)
 I-MO-MGR, Dr. Speer (3)
 I-I/IB-MGR, Col. James
 I-I/IB-SI/IB, Mr. Thompson (3)
 I-I/IB-S-IVB, Mr. McCulloch (3)
 I-I/IB-U, Mr. Simmons (3)
 I-I/IB-T, Mr. Fikes (3)
 I-I/IB-G, Mr. Dunlap

I-I/IB-P, Mr. Johnson
 I-I/IB-E, Mr. Vreuls (3)
 I-I/IB-Q, Mr. Luce (3)
 R-DIR, Mr. Weidner (3)
 R-AERO-F, Mr. Lindberg
 R-ASTR-F, Mr. Hosenthien

KSC:

DG, Mr. Mathews (3)
 DE, Mr. Clearman (3)

SATURN IB/V PROGRAM DIRECTIVE

SUBJECT: SATURN IB/V FLIGHT EVALUATION REQUIREMENTS

ORIGINAL ISSUE DATE: 9/26/66 REVISION NUMBER: _____

DATE OF REVISION: _____ PREPARED BY: _____

Distribution (for information)

MSFC:

DIR, Dr. von Braun
DEP-T, Dr. Rees
I-DIR, Gen. O'Connor
I-DIR, Mr. Hueter
I-DIR, Dr. Mrazek
I-V-MGR, Mr. Bramlet
I-V-MGR, Mr. Murphy
I-V-F, Mr. Rowan
I-MT-MGR, Mr. Balch
I-E-MGR, Mr. Brown
I-E-T, Mr. Mitchell
I-MICH-MGR, Dr. Constan
I-V-S-II, Mr. Gengelbach
I-V-IU, Mr. Powell
I-K, Col. Montgomery
I-K-V, Lt. Col. Murphy
I-K-I/IB, Mr. Lee
I-I/IB-DAC, Mr. Hall
R-DIR, Mr. Cook
R-TO, Mr. Richard
R-OM, Col. Fellows
R-S, Mr. Dannenberg
R-AERO-DIR, Dr. Geissler
R-P&VE-DIR, Dr. Lucas
R-TEST-DIR, Mr. Heimburg
R-ME-DIR, Mr. Kuers
R-ASTR-DIR, Dr. Haeussermann
R-QUAL-DIR, Mr. Grau

KSC:

DA, Maj. Gen. Shinkle
JA, Dr. Gruene (3)